CLAIMS

1. A method of minimizing background illumination while illuminating features formed on a substrate, said method comprising:

generating two light beams using a substantially coherent light source;

directing a first one of said two light beams onto said substrate; and

directing a second one of said two light beams onto of said substrate;

said first and second light beams being directed onto a common location on said substrate such that said first and second light beams interfere with each other and form a pattern of alternating light bands and dark bands on said substrate;

said first and second light beams being further directed such that one of said light bands illuminates a region of said substrate that includes at least one feature formed on said substrate;

said width of said light band and said width of said feature being substantially equal.

2. The method of claim 1 further comprising measuring a property of said feature using light detected from said feature.

3. The method of claim 1 wherein said first and second light beams are directed such that each of a plurality of said light bands illuminates a respective region of said substrate that includes at least one corresponding feature.

4. The method of claim 1 wherein said first and second light beams are further directed such that a spacing between at least two of said light bands is substantially equal to a spacing between two features formed in said substrate and such that one of said light bands illuminates a region of said substrate that includes one of said two features and another of said light bands illuminates another

region of said substrate that includes another of said two features.

5. A method of minimizing background illumination while illuminating features formed on a substrate, said method comprising:

generating two light beams using a substantially coherent light source;

directing a first one of said two light beams onto said substrate; and

directing a second one of said two light beams onto of said substrate;

said first and second light beams being directed onto a common location on said substrate such that said first and second light beams interfere with each other and form a pattern of alternating light bands and dark bands on said substrate;

said first and second light beams being further directed such that a spacing between at least two of said light bands is substantially equal to a spacing between two features formed in said substrate and such that one of said light bands illuminates a region of said substrate that includes one of said two features and another of said light bands illuminates another region of said substrate that includes another of said two features.

6. The method of claim 5 further comprising measuring a property of at least one of said two features using light detected from said one feature.

7. A method of measuring a property of features formed on a substrate, said method comprising:

generating two light beams using a substantially coherent light source;

directing a first one of said two light beams onto said substrate;

directing a second one of said two light beams onto of said substrate; and

measuring a property of at least one feature using light detected from said feature;

said first and second light beams being directed onto a common location on said substrate such that said first and second light beams interfere with each other and form a pattern of alternating light bands and dark bands on said substrate;

said first and second light beams being further directed such that one of said light bands illuminates a region of said substrate that includes said feature formed on said substrate.

8. The method of claim 7 wherein said property is selected from the group consisting of: a line width, a line height, a sidewall angle, a sidewall profile, a trench depth, and a presence of an open or partially opened feature.

9. The method of claim 7 wherein said light detected from said feature is selected from the group consisting of: reflected light and scattered light.

10. The method of claim 7 wherein said width of said light band and said width of said feature are substantially equal.

11. The method of claim 7 wherein said first and second light beams are directed such that each of a plurality of said light bands illuminates a respective region of said substrate that includes at least one corresponding feature.

12. The method of claim 7 wherein said first and second light beams are further directed such that a spacing between at least two of said light bands is substantially equal to a spacing between two features formed in said substrate and such that one of said light bands illuminates a region of said substrate that includes one of said two features and another of said light bands illuminates another region of said substrate that includes another of said two features.

13. An apparatus for measuring a property of features formed on a substrate, said apparatus comprising:

an interferometer operable to generate two light beams using a substantially coherent light source and being further operable to direct said two light beams onto a common location on said substrate such that said two light beams interfere with each other and form a pattern of alternating light bands and dark bands on said substrate such that one of said light bands illuminates a region of said substrate that includes at least one feature formed on said substrate; and

a detection system operable to measure a property of said feature using light detected from said feature.

14. The apparatus of claim 13 wherein said property is selected from the group consisting of: a line width, a line height, a sidewall angle, a sidewall profile, a trench depth, and a presence of an open or partially opened feature.

15. The apparatus of claim 13 wherein said light detected from said feature is selected from the group consisting of: reflected light and scattered light.

16. The apparatus of claim 13 further comprising a control system operable to control direction of said first and second light beams.

17. The apparatus of claim 13 further comprising a control system operable to process a measured value received from said detection system.

18. The apparatus of claim 13 wherein said interferometer directs said two light beams such that said width of said light band and said width of said feature are substantially equal.

19. The apparatus of claim 13 wherein said interferometer directs said two light beams such that each of a plurality of said light bands illuminates a respective region of said substrate that includes at least one corresponding feature.

20. The apparatus of claim 13 wherein said interferometer directs said two light beams such that a spacing between at least two of said light bands is substantially equal to a spacing between two features formed

in said substrate and such that one of said light bands illuminates a region of said substrate that includes one of said two features and another of said light bands illuminates another region of said substrate that includes another of said two features.